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TRANSMITTAL FORM (to be used for all correspondence after initial filing)	Application Number	09/936,640	
	Filing Date	April 9, 2002	
	First Named Inventor	Arjun Selvakumar et al.	
	Art Unit	2856; Confirmation No. 8729	
	Examiner Name	Jacques M. Saint Surin	
Total Number of Pages in This Submission	12	Attorney Docket Number	IO-1012US

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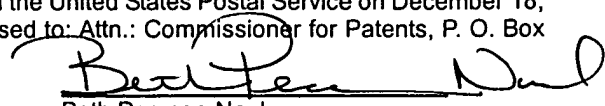
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of :	§	
Arjun Selvakumar et al.	§	Group Art Unit: 2856
	§	
Serial No.: 09/936,640	§	Examiner: Jacques M. Saint Surin
	§	
Filed: April 9, 2002	§	Attorney Docket: IO-1012US
	§	
Title: "Sensor Design and Process"	§	Confirmation No.: 8729

RESPONSE TO OFFICE ACTION DATED SEPTEMBER 18, 2003

Commissioner for Patents
P. O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sirs:

This is in response to the office action dated September 18, 2003. Please amend the application as follows:

12/29/2003 SDENB081 00000060 09936640

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86.00 OP

Amendment to the Description

Please replace the paragraph beginning on page 9, line 9 with the following:

The top capacitor electrode 705 is preferably used for the time- based multiplexing of electrical signals from an external circuit, the operation of which is substantially as described in U.S. patent application serial number [[_____]] 09/936,630, ~~attorney docket number 14737-733~~, filed on [[_____]] September 14, 2001, the disclosure of which is incorporated herein by reference. The top capacitor electrode 705 is preferably located on the bottom surface 408 of the top cap wafer body 406, within an area circumscribed by the top cap parasitic groove 715. In a preferred embodiment, as illustrated in FIG. 7c, the top capacitor electrode 705 includes slots 706 into which the top cap overshock bumpers 720 are fabricated. The top capacitor electrode 705 may be fabricated from any number of conductive materials suitable for creating an electrode, such as, for example, metals, silicides, or doped semiconductors. In a preferred embodiment, the top capacitor electrode 705 is fabricated from a combination of gold and titanium. In a preferred embodiment, the combination of gold and titanium includes a layer of gold located on top of a layer of titanium. The layer of titanium preferably improves the adhesion of the gold to silicon and silicon dioxide.

Please replace the paragraph beginning on page 13, line 25 with the following:

The bottom capacitor electrode 805 is preferably used for the time- based multiplexing of electrical signals from an external circuit, the operation of which is substantially as described in U.S. patent application serial number [[_____]] 09/936,630, ~~attorney docket number 14737-733~~, filed on [[_____]] September 14, 2001, the disclosure of which is incorporated herein by reference. The bottom capacitor electrode 805 is preferably located on the upper surface 423 of the bottom cap wafer body 421, within an area circumscribed by the bottom cap parasitic groove 815. In a preferred embodiment, as illustrated in FIG. 8c, the bottom capacitor electrode 805 includes cutouts 806 into which the bottom cap overshock bumpers 820 are fabricated. The bottom capacitor electrode 805 may be fabricated using any number of conductive materials suitable for creating an electrode such as, for example, metals, silicides, or doped semiconductors. In a preferred embodiment, the bottom capacitor electrode

805 is fabricated from a combination of gold and titanium. In a preferred embodiment, the combination of gold and titanium includes a layer of gold located on top of a layer of titanium. The layer of titanium preferably improves the adhesion of the gold to silicon and silicon dioxide.

Please replace the paragraph beginning on page 17, line 19 with the following:

The ECSA metal bond pad 840 is preferably available for conductive die-attach to an external package into which the accelerometer 305 is placed. The operation of the ECSA metal bond pad 840 is preferably as described in U. S. patent application serial number [[____]] 09/914,421, ~~attorney docket number 14737.743~~, filed on [[____]] March 15, 2000, the disclosure of which is incorporated herein by reference.

Please replace the paragraph beginning on page 20, line 25 with the following:

The cavities 980a may have any shape suitable for reducing stiction within the accelerometer 305. In a preferred embodiment, the cavities 980a are wider than the width *wl* of the top cap overshock bumpers 720, and are located on the metal electrode pattern 910 at areas in which the top cap overshock bumpers 720 come in contact with the metal electrode pattern 910. The cavities 980a in the metal electrode pattern 910 preferably reduce stiction between the top cap overshock bumpers 720 and the metal electrode pattern 910 by eliminating imprinting in the metal electrode pattern 910 that occurs when the top cap overshock bumpers 720 come in contact with the metal electrode pattern 910. The operation of the metal electrode pattern 910 is substantially as that described in U.S. patent application serial number [[____]] 09/936,630, ~~attorney docket number 14737.733~~, filed on [[____]] September 14, 2001, the disclosure of which is incorporated herein by reference.

Please replace the paragraph beginning on page 26, line 10 with the following:

The reduced-thickness recesses 970b preferably reduce stiction between the bottom cap overshock bumpers 820 and the metal electrode pattern 915 by reducing the amount of imprinting in the metal electrode pattern 915 that occurs when the bottom cap overshock

bumpers 820 come in contact with the metal electrode pattern 915. In another preferred embodiment, as illustrated in FIG. 9ad, the metal electrode pattern 915 includes one or more cavities 980b. The cavities 980b in the metal electrode pattern 915 are preferably designed to eliminate stiction between the bottom cap overshock bumpers 820 and the metal electrode pattern 915. The cavities 980b may be formed using any suitable method for forming cavities in the metal electrode pattern 915. In a preferred embodiment, the cavities 980b are formed by selectively removing the gold layer and the titanium layer from the metal electrode pattern 915 to expose the underlying bottom measurement mass half 415. The cavities 980b may have any shape suitable for reducing stiction within the accelerometer 305. In a preferred embodiment, the cavities 980b are wider than the width w2 of the bottom cap overshock bumpers 820, and are located on the metal electrode pattern 915 at areas in which the bottom cap overshock bumpers 820 come in contact with the metal electrode pattern 915. The cavities 980b preferably reduce stiction between the bottom cap overshock bumpers 820 and the metal electrode pattern 915 by eliminating imprinting in the metal electrode pattern 915 that occurs when the bottom cap overshock bumpers 820 come in contact with the metal electrode pattern 915. The operation of the metal electrode pattern 915 is substantially as that described in U.S. patent application serial number [[_____]] 09/936,630, ~~attorney docket number 14737-733~~, filed on [[_____]] September 14, 2001, the disclosure of which is incorporated herein by reference.

Please replace the paragraph beginning on page 37, line 28 with the following:

The accelerometer 305 is preferably placed within the body 1310 of the housing 1305. The accelerometer 305 may be placed within the housing 1305 using any number of methods suitable for securing the accelerometer 305 within the housing 1305. In a preferred embodiment, the accelerometer 305 is placed within the housing 1305 using a solder-die attachment process substantially as disclosed in U.S. Patent Application Serial No. [[_____]] 09/914,421, ~~attorney docket number 14737-743~~, filed on [[_____]] March 15, 2000, the disclosure of which is incorporated herein by reference.